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1992 actuarial analysis
of Optional
Retirement Program
for employees of
Montana University

**Independent Actuarial Analysis
of Optional Retirement Program
For Employees of
Montana University System
Prepared for the Office of Legislative Auditor**

October 9, 1992

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October 9, 1992



STATE OF MONTANA
Office of the Legislative Auditor

STATE CAPITOL
HELENA, MONTANA 59620
406/444-3122

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October 1992

The Legislative Audit Committee
of the Montana State Legislature:

Enclosed is the report on the actuarial review regarding the allocation of employer contributions for the Montana University System Optional Retirement Program. The review is required under section 19-21-111, MCA, and the resulting report is to be presented to the 53rd Legislature.

The review was conducted by Buck Consultants under a contract between the firm and our office. The comments and recommendations contained in this report represent the views of the firm and not necessarily the Legislative Auditor.

Respectfully submitted,


Scott A. Seacat
Legislative Auditor

Enclosure

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BUCK CONSULTANTS

Bank Western Tower
1675 Broadway Suite 1950
Denver, Colorado 80202

October 9, 1992

Office of the Legislative Auditor
Room 135, State Capitol
Helena, MT 59620

Re: Independent Actuarial Analysis of Optional Retirement
Program for Employees of Montana University System

Gentlemen and Ladies:

Buck Consultants is pleased to present in this report our independent actuarial analysis of the effect on the Montana Teachers Retirement System of the Optional Retirement Program for employees of the Montana University System.

Our analysis and recommendations include alternatives to the present financing arrangement to the Teachers Retirement System on behalf of Montana University System employees participating in the Optional Retirement Program that are in our opinion appropriate and equitable to all parties.

We appreciate the cooperation and input of the staff of the Office of the Legislative Auditor, the Montana Teachers Retirement System, and the Montana University System.

Sincerely,



R. Paul Schrader, A.S.A.
Consulting Actuary

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Enclosures

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Introduction

The Montana Legislature authorized an Optional Retirement Program ("ORP") for faculty/contract administrators of the Montana University System ("MUS") commencing January 1, 1988, to meet the recruiting needs of MUS. Previously, all employees of MUS participated in the Montana Teachers' Retirement System ("TRS").

The legislation permitted new faculty/contract administrators to elect which program to participate in at the time of employment. In addition, current participating members in TRS were permitted for a limited time to withdraw from that Plan, forfeit the employer contributions made on their behalf, and transfer accumulated employee contributions from TRS to the ORP or, if vested, leave their accumulated employee contributions in TRS and receive a deferred vested pension.

TRS opposed the offering of the ORP because of a predicted adverse impact on the retirement system. Provision was made for an actuarial study as of July 1, 1990, to determine if there was an adverse impact on TRS from the ORP and to quantify that amount. In the interim, a contribution of 4.503% of the pay of MUS employees who participate in ORP was contributed to TRS.

As of July 1, 1991, 604 of the 2,121 employees of MUS were participating in ORP. At February 10, 1992, the ORP had 675 employees participating with approximately 1,500 employees of MUS continuing to participate as active employees in TRS. Therefore, after four years of ORP, that Plan has achieved a participation level of approximately 31% of the total employment of MUS.

The actuarial study performed as of July 1, 1990 by the consulting actuary for TRS concluded that the ORP combined with the special contribution of 4.503% of pay of ORP participants had not had a significant detrimental impact on TRS currently. The actuary also concluded that if the contribution of 4.503% were eliminated, the contribution requirements for the remaining members of the system would need to be increased by .703% of pay to "maintain TRS at its present financial strength".

Finally, Dr. Richard Barrett of the Department of Economics at the University of Montana prepared a report entitled, *"Measuring the Montana Teachers' Retirement System Unfunded Liability Attributable to Montana University System Faculty"*, suggesting different approaches,

methods and assumptions that might be more appropriate to measure the financial impact of the ORP participation to TRS.

The Montana Legislature in 1991 requested that the Office of the Legislative Auditor conduct a review related to the issue of the appropriate MUS employer contribution (if any) to TRS on behalf of ORP participants. The review is to be made using independent actuarial advice in cooperation with the TRS Board and MUS with the results presented to the 1993 Legislature.

Buck Consultants' was retained to conduct the independent actuarial study and analysis. The results of our study follow.

I. Background

Optional participation in the ORP for new employees of MUS does not in itself create additional costs to TRS immediately. However, the substantive issue is the degree of cost shifting resulting from:

- New employees electing to participate in TRS rather than ORP
- The loss of some or all of the contributions from these new employees who join ORP.

The latter point is likely to be the more critical issue given the funded status of TRS as reported in the 1989 actuarial valuation report.

The retirement system funded under the methodology used by TRS in the July 1, 1989 actuarial valuation of the System is unfavorably impacted by a reduction in participation. In fact, the system will fund currently Unfunded Liabilities over 36 years as reported only if benefits remain as now constituted and:

- All assumptions are precisely realized.
- New entrants to the System enter at the same general age as current members entered into the System.
- The number of active members remains constant and payroll for the active membership increases 6½% per year.

The last item is a very key assumption as shown below.

Of the total statutory funding rate of 14.503% of salaries, 8.827% is required to fund the normal cost based on the 1989 actuarial valuation. This normal cost can be viewed as the ongoing base cost of the System based on average entry ages, and represents the total cost of the system if no Unfunded Liability existed. The difference between 14.503% and 8.827% — 5.676% of pay — is used to pay off Unfunded Liabilities which were \$602.5 million in 1989. But the amount available to pay off these Unfunded Liabilities is far short of the interest on the liability alone, much less an amortization as shown on the next page.

Amount Available	
Payroll of Active Members in 1989	\$358.8 million
% of Contribution Available to Pay off Unfunded Liabilities	<u>5.676%</u>
Amount Available in 1989	\$20.4 million

Interest Needed	
Unfunded Liabilities	\$602.5 million
Interest Payment on Liabilities	<u>8%</u>
Total Interest Required	\$48.2 million

Therefore, the following can be concluded about the Unfunded Liabilities of TRS:

1. The Unfunded Liabilities will substantially increase over the next several years.
2. The current funds available to pay off the Unfunded Liabilities are less than half that needed for interest alone.
3. Only the assumption that the pay on which contributions are based (and the resulting contributions themselves) will substantially increase in the future permits the Unfunded Liability to be amortized over 36 years.

The letter describing the results of the July 1, 1990 actuarial study indicated that the Unfunded Liabilities have increased from \$602 million in 1989 to \$647 million as of 1990.

TRS is highly dependent on an expanding payroll. A decline in membership of even a small percentage of the population is significant.

Exhibits 1-3 that follow illustrate the expected growth in the Unfunded Liabilities for TRS in total, and alternatively, the MUS and non-MUS groups separately. For purposes of these illustrations, we have utilized the results of the calculations made in the July 1, 1990 actuarial study by the TRS actuary and assumed that the ORP participation would increase from 25% of the MUS employees to 85% by 1999 (also assumed by TRS actuary in 1990 study). The exhibits differ only with regard to the additional contribution made to TRS for ORP participants as follows:

Exhibit 1	4.503% of pay
Exhibit 2	5.630 % of pay
Exhibit 3	No contributions

In each case the contributions to pay the Unfunded Liabilities for TRS members remains 5.630% of pay.

The conclusions were:

- Any reduction in the contribution for ORP members will extend the period to fund the Unfunded Liabilities and will increase the amount of the Unfunded Liabilities at each year in the future.
- The MUS Unfunded Liabilities will be amortized at a slower pace if the allocated contributions are less than 5.630%.

These projections from the 1990 actuarial review assume:

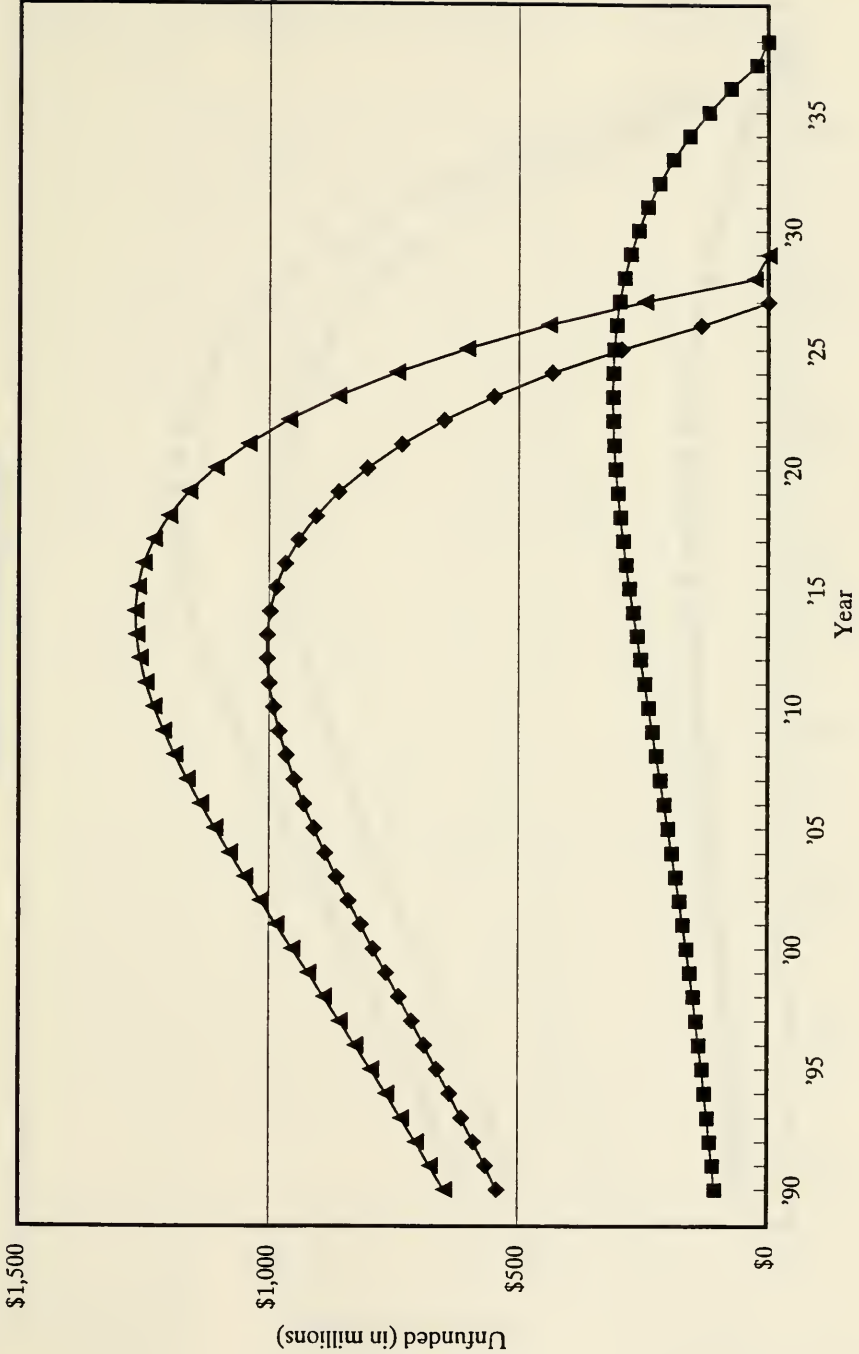
- All members of TRS (including MUS employees) have similar characteristics and will also have similar future experience.
- The experience of TRS in total will match the assumptions.

The conclusion that a contribution to TRS on behalf of MUS/ORP participants is required to be paid against Unfunded Liabilities at approximately the same percentage of payroll available from continuing TRS employees follows directly from the above assumptions. In other words, no attempt was made to separate the MUS and non-MUS participants in TRS in this analysis.

An alternate approach that will recognize the current and actual future experience of the MUS employees in TRS is discussed in this report.

Montana Teachers Retirement System

Schedule of Unfunded Liabilities

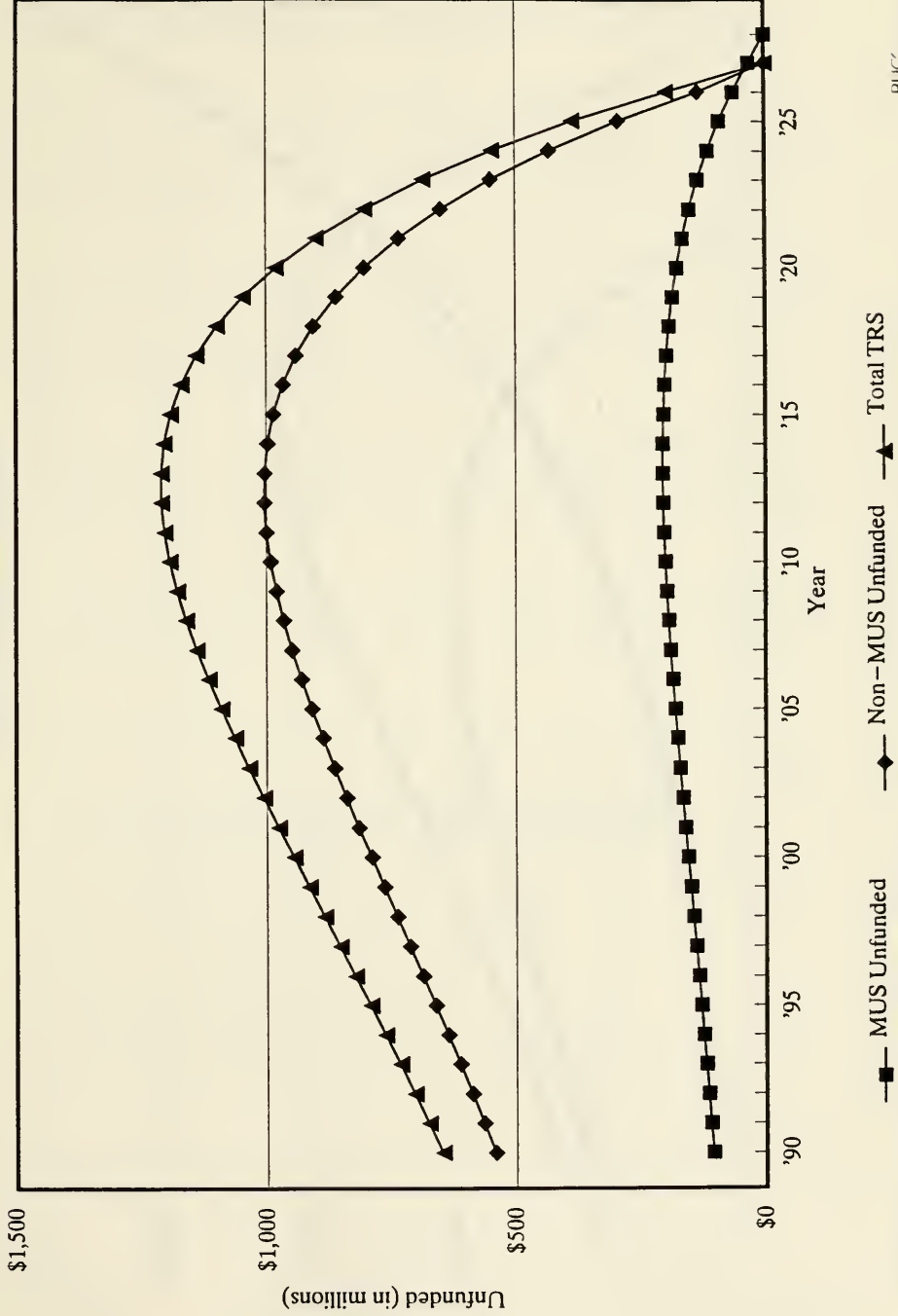


—■— MUS Unfunded —◆— Non-MUS Unfunded —▲— Total TRS

5.630% of pay for TRS members, 4.503% for ORP members.

Montana Teachers Retirement System

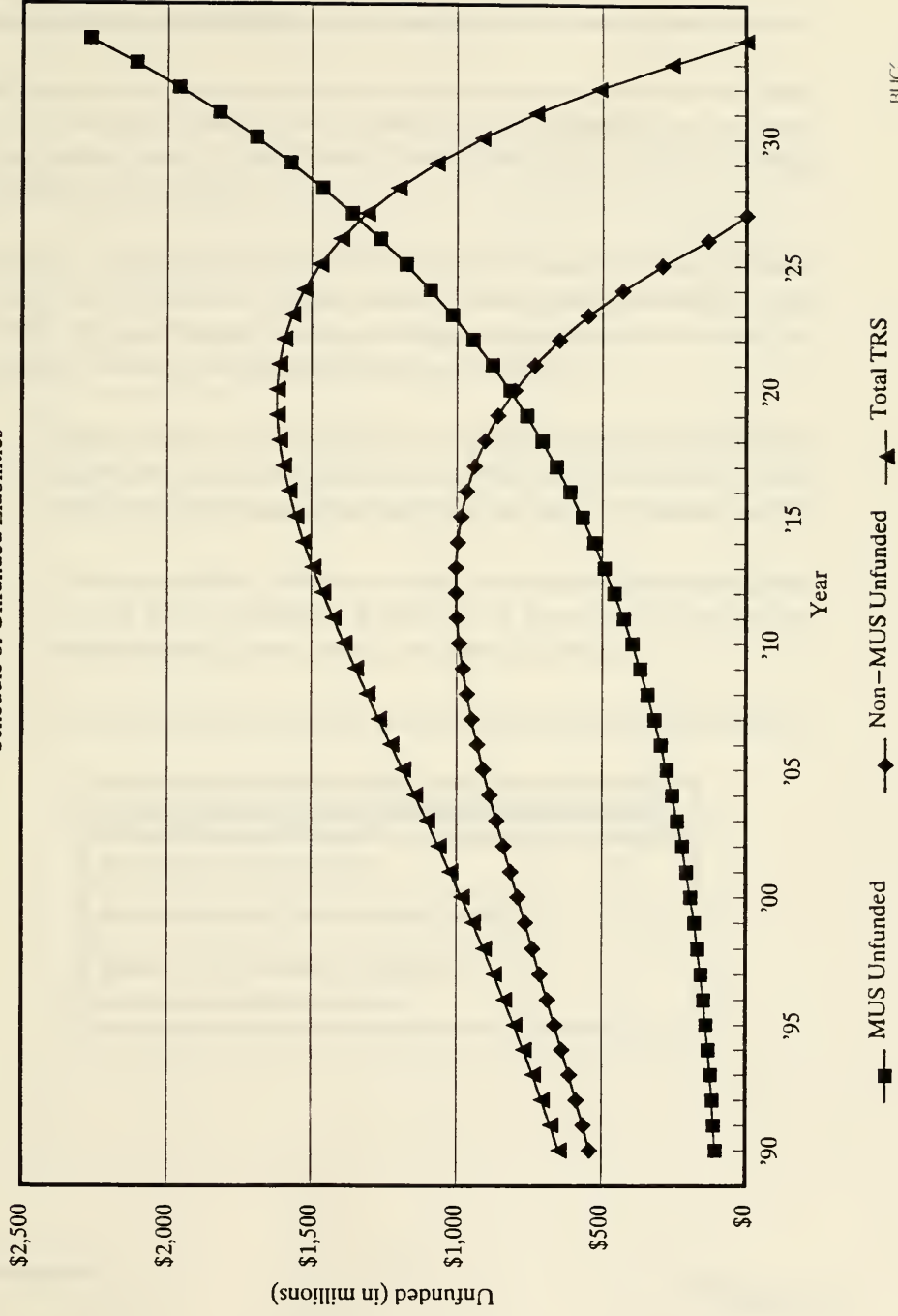
Schedule of Unfunded Liabilities



5.630% of pay for both ORP and TRS members.

Montana Teachers Retirement System

Schedule of Unfunded Liabilities



5.630% of pay for TRS members, 0% for ORP members.

II. Other State Practices

Buck has conducted a regional telephone survey of practices followed by other states with regard to ORP. The purpose of the survey was to identify the practices followed by states that offered a true optional program (a choice between a defined benefit plan like TRS and a defined contribution plan like the ORP).

The survey results follow and confirm that the most common method of providing retirement income for the professional staff of higher education is through a defined contribution plan like an ORP. This type of program is seen as an advantage in higher education for recruitment and portability. The survey (including Montana) indicates the following:

1. Retirement benefits are provided exclusively or optionally through a defined contribution plan like ORP in 12 of 15 states surveyed. In addition, one of the three states providing benefits exclusively through a defined benefit plan is studying how to implement an ORP.
2. Two states in addition to Montana have assessed a contribution to the retirement system on behalf of ORP participants. In each case, the amount is 3% of pay and was determined through a process similar to that followed in Montana.
3. Four of the seven states with an ORP do not make an assessment against ORP members.

Regional Survey of Higher Education Retirement Practices	
Total number of states surveyed	15
Number of surveyed states which have an ORP	7
Number of surveyed states with ORPs that reimburse the defined benefit plan	3

The three states with ORPs that reimburse the defined benefit plan for ORP participation have the following employee and employer contribution rates.

	If Employee in Defined Benefit Plan	If Employee in ORP	
		To ORP	To Defined Benefit Plan
Employee Contributions			
Idaho	5.84%	5.84%	-
Montana	7.04%	7.04%	-
New Mexico	7.60%	7.60%	-
Employer Contributions			
Idaho	9.24%	6.21% *	3.03%
Montana	7.46%	2.96%	4.50%
New Mexico	7.60%	4.60%	3.00%

*Less .67% for group disability benefits

Regional Survey of Higher Education Retirement Practices

Table 1

	Arizona	Colorado	Idaho	Iowa	Kansas
1. How are the teaching employees of higher education currently covered for retirement purposes?	State Retirement System or ORP	PERA or ORP (University of Colorado has had defined contribution plan since 1924)	PERSI or ORP	TIAA-CREF for at least the last 30 years (defined contribution plan)	TIAA-CREF (defined contribution plan)
2. Do you now offer an ORP-type program and, if so, what was the effective date?	Yes; 1/1/75	Yes; 1992 approved by legislature	Yes; 7/90	In practice, all employees participate in defined contribution Plans	No
3. Was the Plan in which the employees previously participated a defined benefit plan? If so, was there an actuarial analysis done of the affect of the ORP?	Yes, but only for 4 years; N/A	Yes; No	Yes. With 3% going to unfunded, no long term fiscal impact on plan, short term gain		
4. Has there been any basis to reimburse the defined benefit retirement plan from which the employees withdrew? If so, how much? How is it determined and how has it changed during the years?	No	No	3% of ORP members pay continues to go to PERSI. Legislature later put a 25 year cap on this payment		
5. Were existing employees of the defined benefit plan permitted to withdraw and go into the ORP? If so, on what basis?	Yes; Ex and ee contributions remain in DB plan	Yes, One time election. Forfeited all employer contributions	Yes, 90-day election period. Forfeited all employer contributions		
6. Are new employees of higher education mandated into the optional plan or are they permitted an option?	One time choice	Mandated into new program based on university election	Mandated		

	Arizona	Colorado	Idaho	Iowa	Kansas
7. If permitted an option, what is the experience that is the percentage that go into the ORP?	Guess: 50%/50%	N/A	N/A		
8. Is the ORP with TIAA-CREF or with some other organization?	TIAA-CREF & VALIC	TIAA-CREF added 1993	TIAA-CREF & VALIC	TIAA-CREF and other options	TIAA-CREF and others
9. What were the objectives of the ORP and why was there a perceived need?	Recruitment	Recruitment/portability	Recruitment		
10. Do you have any comments with regard to the ability of the ORP to meet the objectives established at the time it was offered (i.e., portability, fully vested)?	Portability seen as a big plus	Yes	N/A		
11. Is the ORP concept limited to professional employees of higher education or is the concept offered more broadly?	Professors and administrators at state institutions	Yes, limited to professional employees	Faculty and "non-classified"		Faculty and "non-classified"
12. Has there been a significant number of requests from additional employees to participate in ORP? Have they been allowed?	Community colleges requested ORP; denied		Public school employees requested ORP; denied		
13. Have you considered any complications with regard to IRS non-discrimination rules because of the ORP? Is it an issue in your opinion?	N/A	No			

	Arizona	Colorado	Idaho	Iowa	Kansas
14. Was there any attempt to modify the defined benefit plan to meet the needs of higher education at the time ORP was proposed? If so, how?	No				
Comments					When state retirement system was established in 1962, TIAA-CREF plan was also established for faculty members only. Employees do not have choice of plans.

	Minnesota	Missouri	Montana	Nebraska	New Mexico
1. How are the teaching employees of higher education currently covered for retirement purposes?	Teachers Retirement System (University of Minnesota has had defined contribution plan since 1984)	TIAA-CREF for university system "for many years" (defined contribution plan)	TRS or ORP	TIAA-CREF/Fidelity (defined contribution plan)	4-year colleges - DB or ORP plans, community colleges - DB plan
2. Do you now offer an ORP-type program and, if so, what was the effective date?	No. Defined contribution plan is supplemental plan at other state universities and community colleges	No. Regional teachers currently in state retirement system (defined benefit plan).	Yes, 1/1/88	No	Yes; 10/1/91
3. Was the Plan in which the employees previously participated a defined benefit plan/ If so, was there an actuarial analysis done of the affect of the ORP?			Yes, Yes	No. TIAA CREF since 1961.	Discussed issues - no formal study was done. Acknowledged there would be an impact.
4. Has there been any basis to reimburse the defined benefit retirement plan from which the employees withdrew? If so, how much? How is it determined and how has it changed during the years?			4.503 % of ORP member pay continues to go to DB plan		3 % of ORP members pay continues to go to DB plan
5. Were existing employees of the defined benefit plan permitted to withdraw and go into the ORP? If so, on what basis?			Yes; Forfeited employer contributions		No
6. Are new employees of higher education mandated into the optional plan or are they permitted an option?			Optional		One time option; if no election made, they automatically go into DB plan

	Minnesota	Missouri	Montana	Nebraska	New Mexico
7. If permitted an option, what is the experience (that is, the percentage that go into the ORP)?			80%-90% expected		50%/50%
8. Is the ORP with TIAA-CREF or with some other organization?			TIAA-CREF	TIAA-CREF/Fidelity	TIAA-CREF & VALIC
9. What were the objectives of the ORP and why was there a perceived need?			Recruitment/portability		Recruit at national level. It was not to offer an alternative to DB plan.
10. Do you have any comments with regard to the ability of the ORP to meet the objectives established at the time it was offered (i.e., portability, fully vested)?					Nothing formal done. Informally told it was "of assistance" because of portability.
11. Is the ORP concept limited to professional employees of higher education or is the concept offered more broadly?			Yes, limited to professional employees		Faculty, senior administrators & researchers at 4-year colleges.
12. Has there been a significant number of requests from additional employees to participate in ORP? Have they been allowed?			No		Not as a group. Denied.
13. Have you considered any complications with regard to IRS non-discrimination rules because of the ORP? Is it an issue in your opinion?			No		Yes, discussed at great length. Both actuary and TIAA-CREF legal staff felt it would not be a problem.

	Minnesota	Missouri	Montana	Nebraska	New Mexico
14. Was there any attempt to modify the defined benefit plan to meet the needs of higher education at the time ORP was proposed? If so, how?			No		Yes, 2 alternatives were considered but rejected due to cost: 1) COLA increases for terminated es, 2) giving higher of DB or DC benefits.
Comments	In addition to DB plan, there is a Supplemental Retirement Account (DC plan). It is mandatory.	The "regional teachers" in the state system requested transfer to TIAA-CREF plan and legislation authorizing it was passed. Governor vetoed. "Very political situation."	Payment to TRS is subject to current review		Director commented that he took this as an opportunity to "set things (i.e., the ORP) up the way we wanted" (i.e., one time choice; 4 year schools only, no cash refund). The ORP does <u>not</u> allow cash refunds.

	North Dakota	Oklahoma	Utah	Wyoming	South Dakota
1. How are the teaching employees of higher education currently covered for retirement purposes?	TIAA-CREF. Note: For many years they were covered by both a DB plan and TIAA-CREF. In 1979 4 year colleges opted out of DB plan. In 1985 junior colleges brought under board of higher education and no longer under DB plan.	Teacher's Retirement System (defined contribution plan is a supplement) No	DB and TIAA-CREF No; see comment	DB and TIAA-CREF	State Retirement System
2. Do you now offer an ORP-type program and, if so, what was the effective date?				Yes; 1976/1985	No. Study in progress.
3. Was the Plan in which the employees previously participated a defined benefit plan? If so, was there an actuarial analysis done of the effect of the ORP?	No		See comment		
4. Has there been any basis to reimburse the defined benefit retirement plan from which the employees withdrew? If so, how much? How is it determined and how has it changed during the years?	No		No		
5. Were existing employees of the defined benefit plan permitted to withdraw and go into the ORP? If so, on what basis?	Er and ee contributions were transferred to TIAA-CREF		Yes. Employee contributions transferred only.	1976 - choice between TIAA-CREF alone or both TIAA-CREF and DB plan	
6. Are new employees of higher education mandated into the optional plan or are they permitted an option?	No option		Mandated. See comment.	1985-New employees have one time option to choose DB or TIAA-CREF (no combo)	

	North Dakota	Oklahoma	Utah	Wyoming	South Dakota
7. If permitted an option, what is the experience that is, the percentage that go into the ORP?	N/A		N/A	80% of faculty, 5% of others	
8. Is the ORP with TIAA-CREF or with some other organization?	TIAA-CREF		TIAA-CREF	TIAA-CREF	
9. What were the objectives of the ORP and why was there a perceived need?	The DB plan was not financially sound		Portability	Portability	
10. Do you have any comments with regard to the ability of the ORP to meet the objectives established at the time it was offered (i.e., portability, fully vested)?	There was some concern voiced by faculty concerning DC plan after 1987 market crash				
11. Is the ORP concept limited to professional employees of higher education or is the concept offered more broadly?	Executive and administrative staff research personnel and professionals		Faculty and exempt. See comment.	Any employee of the institution <u>and</u> just faculty	
12. Has there been a significant number of requests from additional employees to participate in ORP? Have they been allowed?	No		No	No	
13. Have you considered any complications with regard to IRS non-discrimination rules because of the ORP? Is it an issue in your opinion?	No		No	No	

	North Dakota	Oklahoma	Utah	Wyoming	South Dakota
14. Was there any attempt to modify the defined benefit plan to meet the needs of higher education at the time ORP was proposed? If so, how?	No		No	No	
Comments		There has been some discussion of offering ORP but never got out of legislative study stage	Prior to 1967 they were covered by DB and TIAA-CREF plans. In 1967 they were given one-time option to choose one or the other and depending on that individual's choice the position was deemed DB or TIAA-CREF		

Benefit Adequacy of a Defined Contribution Plan

Defined contribution plans like ORP are simple in concept as follows:

- Employee and employer contributions are made periodically to the employee's account.
- The employee directs the investment of these current contributions and accumulated amounts among various investment alternatives of varying styles and risks.
- At retirement, the employee's account balance may be paid over various optional forms of payment including lifetime income.

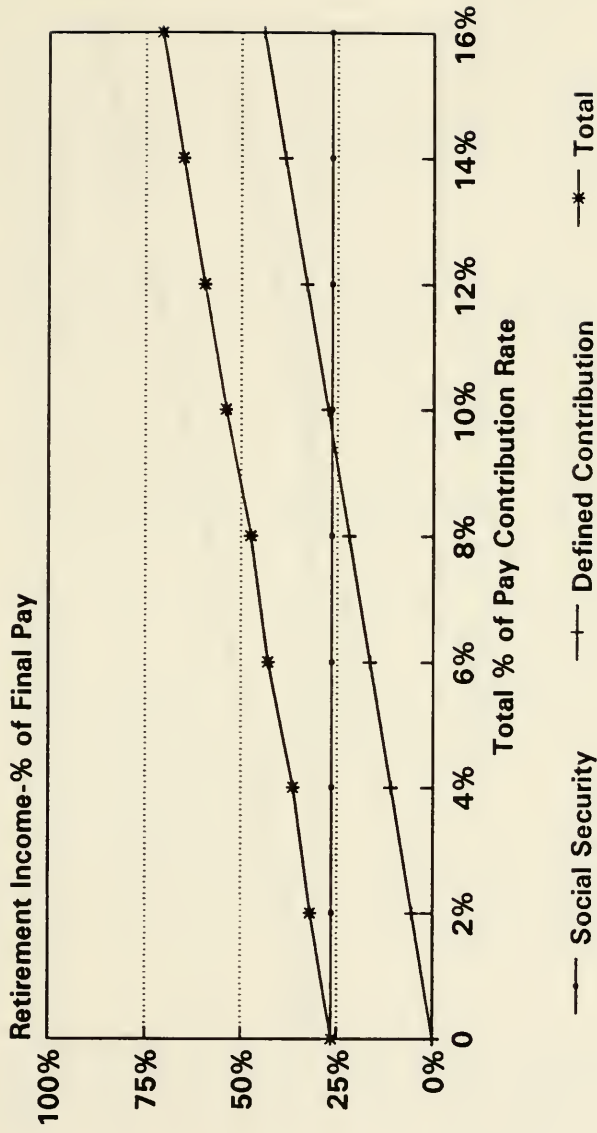
Unlike the defined benefit plan guarantee of monthly lifetime retirement income, the adequacy of an ORP in accumulating a sufficient balance at retirement to meet lifetime income replacement needs is a function of the amount of contributions, investment earnings, salary growth, life expectancy, and length of plan participation. Assuming an employee needs lifetime income replacement of approximately 75% of pay at retirement, the attached Table 2 confirms a total contribution to an ORP of over 16% of pay is needed based on the following:

- Long-term investment return of 8%
- Annual pay increases of 6.5%
- Retirement at age 62
- 30 years of plan participation
- Eligibility for Social Security
- 5% inflation after retirement
- Life expectancy based on 1989 Buck Mortality Table (similar to 1983 Group Annuity Mortality)

If retirement is deferred until age 65, a total contribution of about 12% of pay will be required to meet lifetime income needs which keep pace with inflation (see Table 3).

Montana University System Defined Contribution Plan - Projection of Income Replacement at Age 62

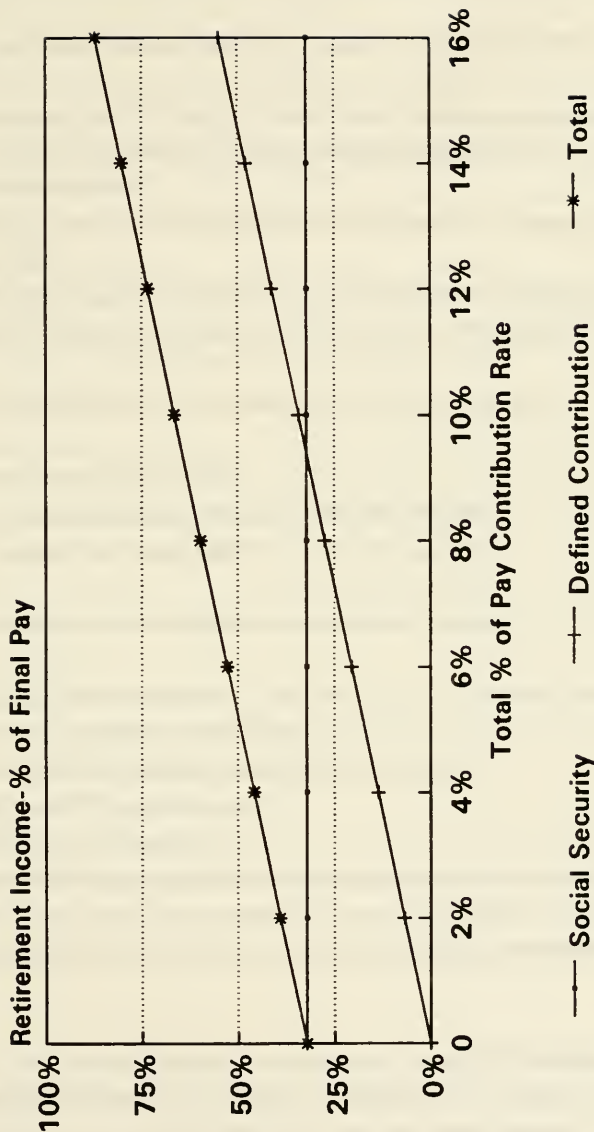
Table 2



For newly hired employee age 32 with
\$25,000 starting salary assuming
5% per year COLA after retirement.

Table 3

Montana University System Defined Contribution Plan - Projection of Income Replacement at Age 65



For newly hired employee age 32 with
\$25,000 starting salary assuming
5% per year COLA after retirement.

III. Methodology and Work Plan

The results of our independent actuarial valuation and analysis will address the following:

1. Does participation in the ORP result in a cost shifting to remaining participants in TRS?
2. What are the funding requirements of the MUS employees participating in TRS compared to the non-MUS employees?
3. If cost shifting occurs, what is the appropriate basis to measure the amount of the cost shifting currently?
4. Should this cost be adjusted in the future due to actual experience of ORP members, the remaining MUS members participating in TRS, and/or other TRS members?

Our analysis and recommendations have been made with the following objectives:

1. Avoid adverse financial affect to TRS.
2. Determine an equitable financial solution for both MUS and TRS.
3. Structure a solution that is permanent and avoids continuing debate.

Our work plan to address the issues outlined above included the following:

1. An independent actuarial valuation of TRS as of July 1, 1991 under current TRS approved actuarial assumptions and methods for:
 - All current TRS participants (including MUS employees)
 - TRS non-MUS participants only
 - TRS MUS participants only

The purpose of this initial analysis was to determine the characteristics of each of the sub groups and the total group and determine if the current contribution of 4.503% of pay for MUS/ORP participants resulted in an appropriate and adequate reimbursement to TRS currently.

2. The July 1, 1991 actuarial valuation also considered all current MUS employees at that date (including ORP members) to determine if the results of our actuarial valuation of TRS would have been significantly different had the ORP not been adopted.

-
3. For the prior members of TRS who joined ORP during the period in which such an election was available, a determination of the value of funds forfeited and the net additional funds expected to be now available to TRS based on the turnover assumptions considered in the actuarial valuation.
 4. Evaluation of the effect of any selection against TRS due to the MUS employees electing to join TRS instead of the ORP since January 1, 1988.
 5. Based on information submitted by one unit of the MUS System, analysis of the experience of these MUS employees to determine if there were any significant variations from the assumptions used in the TRS actuarial valuation.
 6. An actuarial valuation as of July 1, 1991 under an alternate set of actuarial assumptions to provide insight to MUS and TRS of the different funding requirements that might be required for MUS if the future experience of MUS employees were more accurately predicted by these modified assumptions.
 7. Determination of the MUS contribution currently required to TRS for ORP participants to avoid cost shifting.
 8. A projection of the change in the MUS contribution required to TRS for ORP members to avoid cost shifting in the future.
 9. Recommendations for a method and procedure to determine MUS contribution in the future based upon the experience of both TRS and MUS.

IV. Results of Analysis

Actuarial Valuation

The results of our independent actuarial valuation of TRS as of July 1, 1991 and various sub-groups within TRS based on the methodology outlined in Section III are summarized in Exhibit 4 on page 28. The results of those analyses are as follows:

1. The MUS employees participating in TRS, when viewed as a separate entity within TRS (Column (3)), are projected to require a longer Funding Period when compared to non-MUS employees (Column (2)), if no future contributions for MUS/ORP members are made to TRS.
 - A Funding Period of 43 years for MUS members compared to 33 years for TRS non-MUS members.
2. The MUS employees participating in TRS, when viewed as a separate entity within TRS (Column (3)), are projected to require a shorter Funding Period when compared to non-MUS employees (Column (2)), if the present reimbursement rate of 4.503% of compensation for MUS/ORP participants is continued.
 - A Funding Period of 30 years for MUS members compared to 33 years for TRS non-MUS members.
3. A contribution of 2.958% of pay for MUS/ORP participants (Column (3)) would be required currently to achieve an equal Funding Period with TRS non-MUS employees (Column (2)).
 - A Funding Period of 33 years for MUS members compared to 33 years for TRS non-MUS members.
4. An adjustment to the calculations for MUS employees participating in TRS has been made to recognize the forfeited employer contributions upon transfer of MUS/ORP participants at the inception of ORP. This amount has been calculated to be \$1,471,000. The total amount forfeited was \$1,806,000; however, a portion of that amount (\$335,000) was expected to be ultimately forfeited based on the expected rate of

turnover. The adjustment is made in this manner because had TRS been split between MUS and non-MUS members prior to the introduction of ORP, the MUS part of the System would have been credited with a proportionate share of the accumulated assets based on accrued liabilities of each group including the members who subsequently left TRS for ORP. In other words, the expected liabilities for these members would have been eliminated due to the transfer to ORP creating a gain to MUS. For convenience only and to make this adjustment on a one-time basis for these calculations, this procedure recognizes that forfeiture by making an adjustment to the asset split based on current liabilities. This adjustment is recommended as a basis to equitably determine the current unfunded liabilities of MUS and non-MUS participants in TRS only, and is only one element of assessing the funded status of each group. No transfer of assets from TRS is suggested or implied by this adjustment.

5. TRS is at virtually the same funded status it would have been had the ORP never been implemented (Column (4) compared to Column (6)). No noticeable effect to TRS has occurred due to new employees electing TRS or due to the 4.503% reimbursement policy.

- A Funding Period of 32 years for TRS in total compared to 32 years for TRS in total with ORP members.

6. The MUS employees participating in TRS and those participating in ORP have demographic differences (Column (3) compared to Column (5)). However, the MUS employees participating in TRS and all MUS employees do not have significant demographic differences (Column (3) compared to Column (7)). No significant selection against TRS has occurred due to new employees electing TRS.

- A Funding Period of 30 years for TRS/MUS participants compared to 30 years for all MUS participants.

For comparative purposes, the results of the July 1, 1989 actuarial valuation of TRS by the TRS actuary are illustrated in Column (1).

The conclusions of the actuarial analysis and valuation are as follows:

1. No noticeable effect on TRS has occurred to date because of the ORP.
2. The 4.503% contribution on behalf of ORP members is expected to result in a shorter Funding Period for TRS/MUS participants than for non-MUS participants.
3. A current contribution rate of 2.958% of pay from ORP members would result in an equal Funding Period for MUS and non-MUS members of TRS.

The conclusions of our July 1, 1991 actuarial analysis and valuation are based on the participation in TRS and ORP at that date, the actuarial assumptions and methods utilized by TRS, and the contributions made by MUS to TRS on behalf of ORP participants to date. It represents a snapshot view of the actuarial status of TRS in total and the MUS and non-MUS participants and is, therefore, limited in that respect. However, if the current policy of a fixed contribution to TRS for ORP participants is modified to a variable contribution, then a permanent equitable solution is reached. The possibility of the volatility in that contribution is discussed on page 31.

Indiana Teachers' Retirement System
Comparative Summary of Actuarial Valuation Results

	(1) July 1, 1989 TRS Total	(2) July 1, 1991 TRS-Non-MUS	(3) July 1, 1991 TRS-MUS	(4) July 1, 1991 TRS Total	(5) July 1, 1991 ORP-MUS	(6) + (5) July 1, 1991 Total with ORP Employees	(7) (3) + (5) July 1, 1991 MUS Total
Number of Participants							
Actives	15,087	14,748	1,517	16,265	604	16,869	2,121
Retireds	6,330	5,734	831	6,565	0	6,565	831
Deferred Vesteds	1,074	931	166	1,097	0	1,097	166
Total	22,491	21,413	2,514	23,927	604	24,531	3,118
Earnings	\$358,789,345	\$362,620,512	\$53,024,346	\$415,644,858	\$20,609,314	\$436,254,172	\$73,633,660
Average Earnings	\$23,781	\$24,588	\$34,953	\$25,555	\$34,121	\$25,861	\$34,716
Average Age	42.0*	42.0	46.8	42.5	39.5	42.4	44.7
Average Service	12.3*	10.6	12.4	10.8	2.3	10.5	9.5
Normal Cost %	8.827%	8.926%	9.107%	8.945%	9.486%	8.976%	9.246%
Present value of benefits	\$1,490,474,980	\$1,399,627,760	\$232,557,814	\$1,632,185,574	\$23,068,471	\$1,655,254,045	\$255,626,285
Present value of future normal costs	\$234,202,070	\$218,051,188	\$26,379,478	\$244,430,666	\$15,839,058	\$260,269,724	\$42,218,536
Accrued Liability	\$1,256,272,910	\$1,181,576,572	\$206,178,336	\$1,387,754,908	\$7,229,413	\$1,394,984,321	\$213,407,749
Assets at Actuarial Value	\$653,744,203	\$657,852,234	\$116,262,500	\$774,114,734	** \$5,650,000	\$779,764,734	\$121,912,500
Unfunded Liability	\$602,528,707	\$523,724,338	\$89,915,837	\$613,640,175	\$1,579,413	\$615,219,588	\$91,495,250
Funding Period with 4.503 % ORP Contribution	36 years	33 years	30 years	32 years	2 years	N/A	N/A
Funding Period without 4.503% ORP Contribution	N/A	N/A	43 years	34 years	N/A	32 years***	30 years***
Funding Period with 2.958% ORP Contribution	N/A	N/A	33 years	33 years	N/A	N/A	N/A

* Full-time employees only

** Estimated asset amount if ORP members had participated in TRS from hire date based on actual cash flow information contained in RFP.

*** Assumes total contributions of 14.503% of pay.

Review of Actuarial Assumptions for MUS Employees

The actuarial assumptions used in determining the funded status of TRS in total have been reviewed periodically and modified when experience warranted. However, the assumptions or the experience review have not considered any experience variations for MUS and non-MUS employees in the past.

Separate experience data for the MUS and non-MUS participants in TRS is not available from the TRS offices and total MUS experience is generally not available from the various entities within MUS. However, we did request and receive information from one of the universities which allowed us to perform a limited experience analysis.

Based on this experience, we have modified the assumptions for rates of retirement and termination. The determination of the effect on the actuarial status of the System is for illustrative purposes only to quantify for TRS and MUS what the impact might be on the System if variations in the experience of MUS employees occurs. These changes are not recommended as appropriate for either MUS or for non-MUS TRS members but are meant to provide additional data as to the potential volatility and long-term effect of experience variations.

Accordingly, for purposes of illustration, we have determined the effect on the actuarial status of the MUS participants in TRS if the following changes were made:

- The rates of early retirement are reduced.
- The rates of turnover are increased.

These changes are illustrated below:

Sample Ages	Annual Rates of Separation	
	Current	Modified
25	13.8%	17.3%
35	8.3	10.4
45	3.6	4.5
55	1.8	2.3

Sample Ages with 25 Years of Service	Annual Rates of Retirement	
	Current	Modified
50	20%	5%
55	25	15
60	30	10
65	30	40

These two changes in assumptions result in the following changes to the actuarial valuation of MUS members participating in TRS:

	Before Changes	After Changes
NC%	9.1%	9.1%
Unfunded Liability	\$89.9 million	\$94.7 million
Funding Period	30 years	31 years

With delayed retirement we would normally expect an improvement in the Funding Period. However, the combination of very high early retirement rates under TRS with the increased liability of delayed retirement has resulted in a slight increase in the Funding Period under these assumption changes.

Sufficient or credible data to recommend actuarial assumption modifications for MUS employees is not available. However, the alternate approach suggested in this report will result in MUS contributions to TRS being based on the actual experience of MUS employees.

Forecast of MUS Continuing Requirements to TRS

The attached Exhibits 5-7 on pages 33 - 35 illustrate a 10-year forecast of the MUS experience in TRS under the following conditions:

- all assumptions will be realized including the expectation that employees will terminate, die, become disabled, or retire in accordance with the current assumptions
- the active employment of MUS remains constant

-
- new employees at MUS will be approximately the same age at hire as has been the recent experience and will be paid at a rate to maintain the 6.5% annual pay increase assumption for the entire group
 - the percentage of new employees electing to join ORP or TRS will vary as follows:
 - 50% of new employees elect ORP, resulting in 47% ORP participation by 2001
 - 91% of new employees elect ORP, resulting in 76% ORP participation to 2001
 - the contribution to TRS for ORP members is:
 - 4.503% of pay
 - 5.396% of pay initially and changing to the contribution available to pay Unfunded Liabilities with each TRS actuarial valuation
 - No contribution

In addition, a final forecast is illustrated in Exhibit 8 on page 36 that illustrates the MUS contribution needed for ORP members if:

- the initial contribution is 2.958% of pay
- the contribution is adjusted each year to achieve a one-year reduction in the Funding Period from the prior year

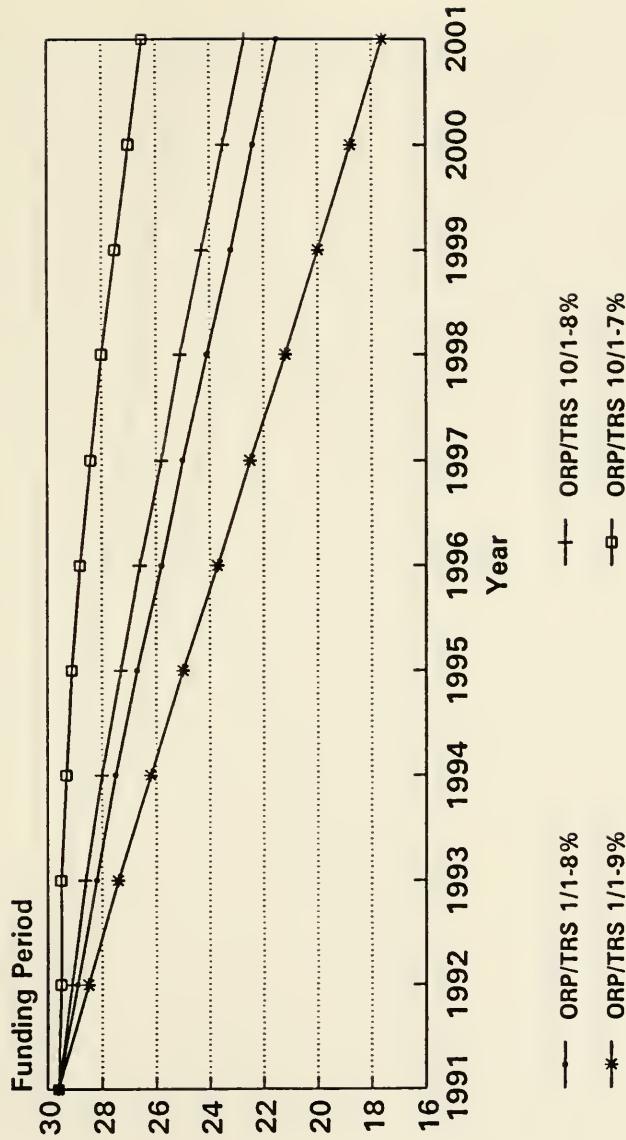
In addition, the effect of the actual investment return varying by 1% per annum from the assumed rate (8%) is illustrated to indicate the sensitivity of this assumption and the volatility of the results.

The results of these forecasts, assuming that all the actuarial assumptions under TRS are realized, indicate that an appropriate MUS contribution to TRS on behalf of ORP members will likely escalate. While these conclusions are highly dependent upon all the assumptions being realized and the percentage of employees electing to go into TRS and ORP, the analysis illustrates the following:

1. With a declining group of MUS participants in TRS, it is likely that an increasing contribution will be required when expressed as a percentage of pay of MUS employees participating in ORP. In other words, the MUS participation in TRS is likely to become more expensive as a percentage of payroll for the remaining MUS members of TRS.

-
2. If a modification is made to the present reimbursement arrangement in accordance with the procedure outlined in this report and current assumptions are realized, it would be appropriate for MUS to anticipate for planning purposes that the required contribution to TRS on behalf of MUS/ORP participants will increase in the future (as a percentage of pay for ORP members). However, as shown this would be increased or decreased based on the actual experience of MUS employees and the overall experience of TRS.

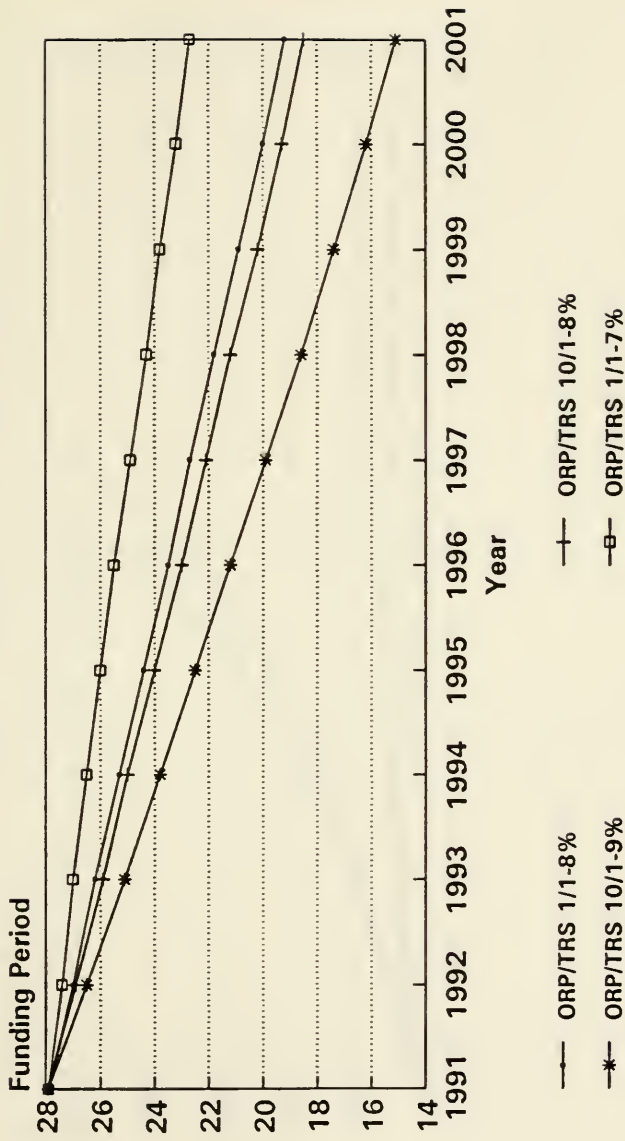
Montana Teachers Retirement System Funding Period for MUS/TRS



Assuming 4.503% of pay for ORP members
by various ORP vs. TRS election rates
and investment return rates.

Montana Teachers Retirement System Funding Period for MUS/TRS

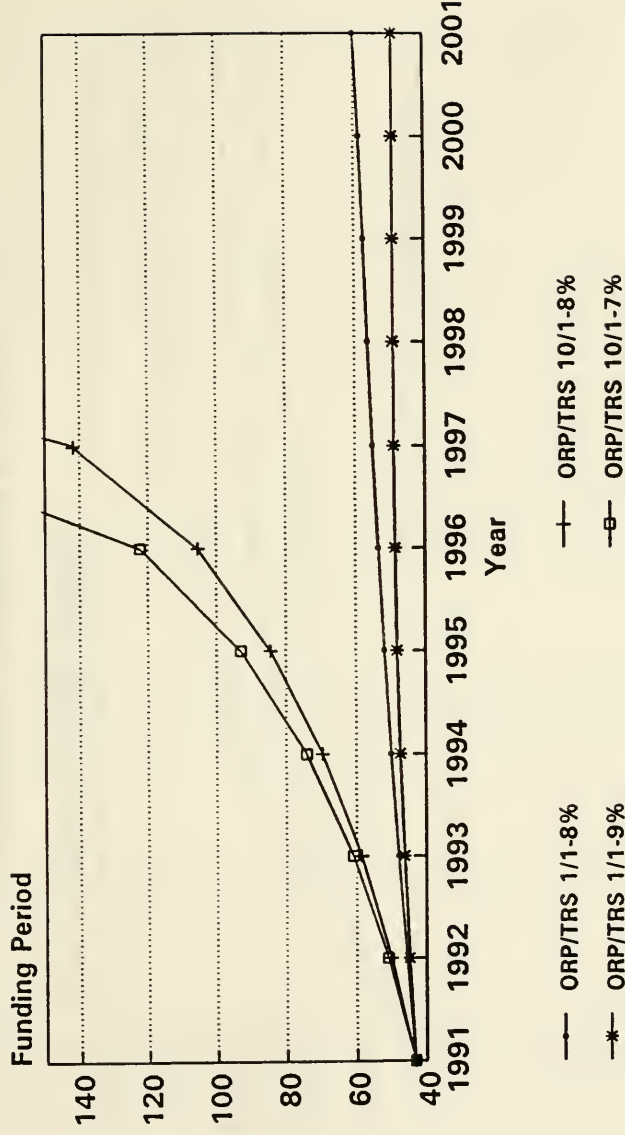
Exhibit 6



Assuming 5.396% of pay for ORP members
by various ORP vs. TRS election rates
and investment return rates.

Montana Teachers Retirement System Funding Period for MUS/TRS

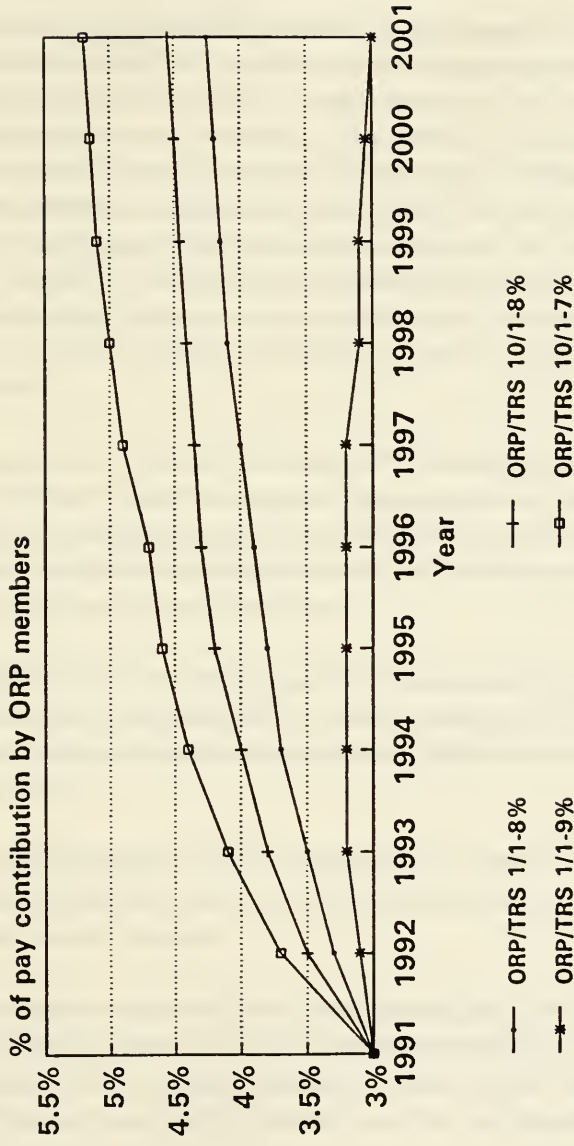
Exhibit 7



Assuming no contribution for ORP members
by various ORP vs. TRS election rates
and investment return rates.

Montana Teachers Retirement System Additional Funding Needed to Pay-off Unfunded Liabilities of MUS/TRS

Exhibit 8



Assuming unfunded is systematically amortized, shown by various ORP vs. TRS election & investment return rates.

V. Recommendations

Based on our independent review and actuarial calculations, Buck Consultants is of the opinion that the current procedure requiring MUS to contribute to TRS an amount equal to 4.503% of pay for MUS/ORP participants has been a fair and reasonable approach to date. In our opinion, neither TRS nor MUS has been treated inequitably by this procedure and it could be continued in the future as an appropriate method to compensate TRS for the loss of funding from ORP members. It has the advantages of simplicity and fairness to date. From the ORP participant viewpoint, it has the disadvantages of requiring significant contributions to TRS at no benefit to the ORP member. From the TRS viewpoint, the current amount is less than the 5.676% of pay available to pay off Unfunded Liabilities as determined in 1989 for all TRS members. Finally, it may continue to be viewed as an imprecise calculation by both parties that does not result in a permanent resolution.

In addition, this procedure does not reflect the differences in TRS membership for MUS and non-MUS employees and will not recognize future experience variations separately for MUS and non-MUS members of TRS. An alternative procedure that would meet the objectives for an equitable allocation of TRS costs as outlined in this study both currently and in the future and reflect the future experience of each group separately is as follows:

1. Separate TRS by MUS and non-MUS participants and allocate assets on the basis of total Unfunded Liabilities (with the adjustment for amounts forfeited due to the election of TRS members to participate in ORP at the inception date of ORP) as of the initial starting date of July 1, 1991.
2. Modify the MUS contribution to TRS for ORP members to 2.958% of pay from the present 4.503% of pay based on the results of this 1991 actuarial valuation. This change would be made as soon as practical.
3. Maintain an allocation of assets in TRS for all periods after July 1, 1991 separate for MUS and non-MUS participants in TRS based upon employee/employer contributions, benefit payments, and an appropriate allocation of expenses for each. Realized and unrealized investment income would be allocated in proportion to average asset balances.

-
4. At the time of each future actuarial valuation of TRS, determine the amount of contribution (as a percentage of payroll) required for MUS/ORP participants that would result in the MUS portion of TRS having exactly the same Funding Period as TRS non-MUS participants.
 5. The amount of MUS contribution to TRS on behalf of ORP participants would be adjusted to the new level on the January 1 following the then current actuarial valuation of TRS or at other agreed-upon recalculation dates. The contribution would remain constant as a percentage of payroll until the next actuarial valuation of TRS or agreed-upon recalculation date.

If this alternate procedure is adopted, Buck recommends that the actual experience of MUS and non-MUS members of TRS be analyzed separately so that any differences noted can be considered in the recommended actuarial assumptions for future actuarial valuations of TRS.

Based on these recommendations, the MUS group will currently and in the future make a contribution to TRS on behalf of MUS ORP members based on the actual experience of MUS. Since this MUS contribution will over time fluctuate with the actual experience of MUS participants in TRS, it will be fair and equitable; however, the disadvantage of this alternative is that it may also be volatile and result in a higher or lower contribution than the past rate of 4.503% or the alternate current rate of 2.958%. This alternate procedure will result in the funded status of TRS, as measured by the expected time period to fund the Unfunded Liabilities (Funding Period), being equal for MUS and non-MUS employees of TRS.

Alternatives to the above approach that are consistent with the objectives outlined earlier include the following:

1. MUS could terminate participation in TRS and remove all accrued liabilities and allocated assets from TRS and assume the total responsibility for future funding. Plan design could be modified by legislative action and plan administration could be arranged by MUS.
2. MUS could manage and reduce the future funding requirements (subject to statutory limitations) for its membership in TRS by:

-
- Freezing current benefits and providing future retirement income through a defined contribution plan for all MUS employees; or
 - Considering benefit reductions (e.g., the early retirement eligibility, the benefit formula, and retiree increases).

Buck has calculated that the accrued liabilities of MUS participants in TRS (based on current accrued benefits considering service and pay accumulated to date) exceed the accumulated assets allocated to MUS employees by approximately \$25 million as of July 1, 1991, based on the actuarial assumptions utilized by TRS.

Appendix A

**The Teacher's Retirement System
of the State of Montana**

SUMMARY OF ACTUARIAL ASSUMPTIONS

1. Investment Return 8% per annum, compounded annually.
2. Retirement Age According to the following table upon attainment of age 60 and completion of 5 years of service or upon completion of 25 years of service.

Age	Annual Rate Per 100 Members Eligible to Retire
54 & under	20
55 - 59	25
60	30
61	35
62	45
63	35
64 - 69	30
70	100

3. Mortality, Disablement and Separation

a. Mortality

Active members

1983 Group Annuity Mortality Table set back 2 years. See table for sample values.

Retired members

1983 Group Annuity Mortality set back one year. See table for sample values.

Annual Rate Per 100 Members					
Age	Active Mortality		Age	Retired Mortality	
	Male	Female		Male	Female
25	.04	.02	45	.19	.09
30	.05	.03	50	.35	.15
35	.07	.04	55	.57	.23
40	.10	.06	60	.84	.38
45	.17	.08	65	1.39	.64
50	.31	.14	70	2.48	1.09
55	.52	.21	75	4.04	2.11
60	.77	.34	80	6.71	3.86
65	1.24	.58	85	10.61	6.38

b. Disablement

Graduated rates. See table for sample values.

c. Separation

Graduated rates. See table below for sample values.

Annual Rate Per 100 Members		
Age	Disablement	Separation
25	.009	13.78
30	.022	11.41
35	.036	8.30
40	.067	5.84
45	.121	3.63
50	.189	2.43
55	.414	1.80
60	.864	1.33
65	.981	0.00

4. Compensation Increases

6.5% per year, compounded annually.

5. Marital Status

a. Percentage married

100%

b. Age difference

Males are assumed to be two years older than females.

6. Actuarial Value of Assets

For purposes of calculating the Actuarial Value of Assets, common stock is valued at market value with gains and losses spread over a three-year period. Mortgages are decreased by unaccumulated mortgage discount. All other assets are valued at cost value.

7. Interest on Member Contributions

4% per annum.

8. Provision for Expenses

The administrative expenses are assumed to be paid from investment earnings in excess of the assumed rate of 8%.

9. Actuarial Cost Method

Entry Age Normal Level Funding Method. Covered Compensation was assumed to increase at the rate of 6.5% per annum for determining the Funding Period for amortizing the unfunded actuarial accrued liability.

Appendix B

**The Teacher's Retirement System
of the State of Montana**

**SUMMARY OF PRINCIPAL BENEFIT PROVISIONS
IN EFFECT AS OF JULY 1, 1987**

Name of the System

The Teachers' Retirement System of the State of Montana

Effective Date

TRS became effective September 1, 1937.

Type of System

TRS is a governmental retirement system created by Act of the State of Montana. The Retirement System is administered and operated by the Retirement Board.

Employers Included

Employers include the State of Montana, the trustees of a district, or any other agency or subdivision of the State which employs a person who is designated a member of the retirement system.

Employees Included

Generally, all employees who are employed in the following capacities for at least 30 days in any fiscal year and have compensation for creditable service totally paid by an employer:

- teacher, principal or district superintendent;
- administrative officer or a member of the instructional or scientific staff of a vocational-technical center or a unit of the Montana University System who has not elected to participate in the optional retirement program;
- speech therapist, school nurse, or school psychologist;
- administrative officer or instructional staff of board of public education.

Substitute teachers become an active member of the retirement system on the 31st day of employment in any fiscal year, unless they elected to become an active member on their first day of employment.

Service Considered

Creditable Service is the period of employment which is considered for eligibility for benefits and in determining the amount of benefits. It includes years and fractional years for which Member contributions were made.

A Member may also receive up to five years of Creditable Service for out-of-state teaching, employment while on leave, active service in the military, merchant marine or Red Cross or for employment in private schools, if certain contributions are made. A Member may also transfer credits from the Montana Public Employees Retirement System if certain conditions are met.

Creditable Service for determining benefit amounts may be purchased by Members with five or more years of Creditable Service. One year of additional service may be purchased for each five years of service for which contributions were made, up to a maximum of five years of additional service.

Earned Compensation

Earned Compensation is the full compensation actually paid to a Member, plus Member's TRS contributions made on a before-tax basis, plus any amounts contributed to a Section 125 cafeteria plan, or paid under a salary reduction agreement, a tax sheltered annuity, a deferred compensation program and the value of any housing provided by the employer.

Average Final Compensation

Average Final Compensation is the highest average of the annual Earned Compensation during three consecutive years of service on which contributions have been made.

Contributions

Members: 7.044% of Earned Compensation

Employers: 7.459% of Earned Compensation

Member contributions are made on a pre-tax basis as permitted under Section 414(h) of the Internal Revenue Code.

Member contributions are credited with interest at 4% compounded annually or any other rate as may be set by the retirement board.

Normal Retirement Benefit

Members who have attained age 60 and who have at least five years of Creditable Service, or Members with at least 25 years of Creditable Service, are entitled to retire with an immediate benefit. The benefit is equal to one-sixtieth of Average Final Compensation times years of Creditable Service.

Early Retirement Benefit

Any member with at least five years of Creditable Service can retire upon attainment of age 50. The Member will be entitled to receive the Normal Retirement Benefit based on Creditable Service and Earned Compensation to date of termination, reduced by $\frac{1}{2}$ of 1% for each of the first 60 months and $\frac{3}{10}$ of 1% for each additional month by which commencement of payments precedes the date he could have receive a Normal Retirement Benefit if he had continued working.

Deferred Vested Benefit

In lieu of any benefits under the System, a terminating Member may withdraw his accumulated contributions with interest. Subject to approval of the retirement board. Members who are rehired may redeposit their accumulated contributions plus the interest that would have been earned had the contributions not been withdrawn.

If a terminating Member with at least five years of Creditable Service does not elect a refund of contributions, he will be entitled to receive the Normal or Early Retirement Benefit.

Disability Benefit

An active Member who becomes disabled with at least five years of Creditable Service, but prior to age 50, is entitled to an immediate benefit, payable monthly, equal to one-sixtieth of Average Final Compensation times years of Creditable Service, but not less than 25% of Average Final Compensation.

If a Member receiving a disability benefit is gainfully employed or able to be gainfully employed, the disability benefit payable may be reduced.

Death Benefits

Upon the death of an active Member, his beneficiary may elect to receive either:

- a lump sum equal to the Member's Accumulated Contributions with interest; or

Appendix C

**The Teacher's Retirement System
of the State of Montana**

Summary of Assets

	<u>Cost Value</u>
Cash	\$ 2,479,158
Mortgages	51,316,774
Securities	480,899,392
Common Stock	162,493,413
Land and Buildings	114,179
Other Assets	44,848,489
Receivables	20,044,529
Payables	<u>(733,235)</u>
Assets at June 30, 1991	\$ 761,462,699

Stock Appreciation

Market Value	\$ 202,445,362
Cost Value	- <u>162,493,413</u>
Appreciation	\$ 39,951,949

Development of Actuarial Value of Assets

Cost Value	\$ 761,462,699
Post-retirement Adjustment Reserve Fund	- <u>665,281</u>
Net Cost Value	\$ 760,797,418
Stock Appreciation ÷ 3	+ <u>13,317,316</u>
Actuarial Value at July 1, 1991	\$ 774,114,734

**The Teachers' Retirement System
of the State of Montana**

**Allocation of Actuarial Value
of Assets Between MUS and Non-MUS
(July 1, 1991)**

			Total
1. Total actuarial value of assets at 7/1/91			\$ 774,114,734
2. Non-forfeitable MUS contributions for prior TRS members electing ORP			<u>1,471,057</u>
3. Net actuarial value of assets at 7/1/91			\$ 772,643,677
	MUS	Non-MUS	Total
4. Accrued liability at July 1, 1991	\$ 206,178,336	\$ 1,181,576,572	\$ 1,387,754,908
5. Allocation percentage	14.85697%	85.14303%	100%
6. Allocated assets (item 3 x item 5)	\$ 114,791,443	\$ 657,852,234	\$ 772,643,677
7. Non-forfeitable MUS contributions	\$ <u>1,471,057</u>	\$ <u>0</u>	\$ <u>1,471,057</u>
8. Net actuarial value of assets at July 1, 1991 (item 6 + item 7)	\$ 116,262,500	\$ 657,852,234	\$ 774,114,734

Active Participants for The State of Montana as of July 1, 1991
TRS Non – Montana University System

Age	Service										Total	
	1	5	10	15	20	25	30	35	40+			
20	21 231,326	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	21 231,326	Number Salary	
25	587 9,099,762	161 3,033,661	0 0	0 0	0 0	0 0	0 0	0 0	0 0	748 12,133,423	Number Salary	
30	481 7,067,162	704 14,163,360	225 5,457,265	0 0	0 0	0 0	0 0	0 0	0 0	1,410 26,687,787	Number Salary	
35	582 7,897,708	615 12,258,046	749 18,787,974	215 6,314,053	0 0	0 0	0 0	0 0	0 0	2,161 45,257,781	Number Salary	
40	705 9,496,070	666 14,353,883	610 16,117,724	884 26,891,575	349 11,623,503	1 28,875	0 0	0 0	0 0	3,215 78,511,630	Number Salary	
45	874 11,599,270	496 10,925,979	415 11,353,563	516 16,054,710	895 30,762,516	296 10,877,010	0 0	0 0	0 0	3,492 91,573,048	Number Salary	
50	236 3,170,595	253 5,333,000	235 6,279,931	257 7,910,489	349 11,780,688	527 18,959,065	148 5,455,980	1 34,554	0 0	2,006 58,924,302	Number Salary	
55	119 1,522,727	90 1,630,267	91 2,200,822	147 4,084,371	158 5,216,774	191 6,581,277	214 7,889,791	49 1,924,914	1 39,859	1,060 31,090,802	Number Salary	
60	53 641,144	33 624,030	37 893,270	56 1,446,594	86 2,731,565	81 2,669,994	70 2,463,078	73 2,827,016	17 688,256	506 14,984,947	Number Salary	
63	11 165,370	10 187,201	6 138,676	8 198,113	17 440,721	14 495,776	10 319,121	4 160,788	5 210,926	85 2,316,692	Number Salary	
66	0 0	1 4,020	0 0	3 84,214	1 27,668	2 65,468	1 37,785	1 28,431	1 27,055	10 274,641	Number Salary	
67	0 0	0 0	0 0	2 36,765	2 71,366	0 0	1 28,580	2 66,868	0 0	7 203,579	Number Salary	
68+	11 74,204	5 26,096	2 38,861	0 0	2 59,299	3 104,838	3 94,178	0 0	1 33,346	27 430,822	Number Salary	
Total	3,680 50,965,338	3,034 62,539,543	2,370 61,268,086	2,088 63,020,884	1,859 62,711,100	1,115 39,782,303	447 16,288,513	130 5,042,571	25 999,442	14,748 362,620,780	Number Salary	

Active Participants for The State of Montana as of July 1, 1991
TRS Montana University System

Age	Service										Total	
	1	5	10	15	20	25	30	35	40+			
20	0	0	0	0	0	0	0	0	0	0	Number Salary	
	0	0	0	0	0	0	0	0	0	0	0	
25	21	5	0	0	0	0	0	0	0	0	Number Salary	
	407,789	89,370	0	0	0	0	0	0	0	0	497,159	
30	35	26	3	0	0	0	0	0	0	0	Number Salary	
	766,568	671,619	74,122	0	0	0	0	0	0	0	1,512,309	
35	57	59	17	3	0	0	0	0	0	0	Number Salary	
	1,297,091	1,651,346	537,076	92,893	0	0	0	0	0	0	3,578,406	
40	59	98	51	30	6	2	0	0	0	0	Number Salary	
	1,391,057	2,793,389	1,763,384	1,151,373	211,366	93,825	0	0	0	0	7,404,394	
45	90	62	63	69	44	8	0	0	0	0	Number Salary	
	1,871,163	2,047,775	2,447,119	2,734,342	1,787,681	282,815	0	0	0	0	11,170,895	
50	14	37	39	52	85	76	3	0	0	0	Number Salary	
	257,194	1,043,544	1,516,298	1,980,036	3,456,021	3,341,068	124,159	0	0	0	11,718,320	
55	13	17	18	19	45	62	41	2	0	0	Number Salary	
	370,348	606,833	739,498	824,008	1,895,069	2,780,829	1,924,007	111,752	0	0	9,252,344	
60	5	9	16	10	26	28	31	20	1	1	Number Salary	
	107,983	354,337	739,881	464,472	1,000,531	1,310,865	1,485,483	855,229	42,608	42,608	6,361,389	
63	1	2	2	3	1	3	5	5	1	1	Number Salary	
	16,482	114,671	95,471	132,699	44,628	139,202	204,374	210,695	42,925	42,925	1,001,147	
66	0	2	0	0	1	2	0	0	2	2	Number Salary	
	0	91,789	0	0	34,945	94,516	0	0	88,905	88,905	310,155	
67	3	1	1	0	0	0	0	0	0	0	Number Salary	
	11,833	28,019	41,731	0	0	0	0	0	0	0	81,583	
68+	0	2	0	1	0	0	1	0	1	1	Number Salary	
	0	6,679	0	44,091	0	0	39,071	0	46,424	46,424	136,265	
Total	298	320	210	187	208	181	81	27	5	5	Number Salary	
	6,497,508	9,499,371	7,954,580	7,423,914	8,430,241	8,043,120	3,777,094	1,177,676	220,862	220,862	53,024,366	

Active Participants for The State of Montana as of July 1, 1991
 ORP TIAA – CREF Montana University System

Age	1	5	10	15	20	25	30	35	40+	Total	
20	1 25,000	0	0	0	0	0	0	0	0	1 25,000	Number Salary
25	17 385,699	0	0	0	0	0	0	0	0	17 385,699	Number Salary
30	74 1,964,059	15 409,891	0	0	0	0	0	0	0	89 2,373,950	Number Salary
35	83 2,538,583	53 1,927,509	0	0	0	0	0	0	0	136 4,466,092	Number Salary
40	90 2,932,854	74 2,829,229	3 102,761	0	0	0	0	0	0	167 5,864,844	Number Salary
45	53 1,736,628	66 2,830,758	2 67,781	0	0	0	0	0	0	121 4,635,167	Number Salary
50	25 696,105	22 914,063	0	1 62,370	0	0	0	0	0	48 1,672,538	Number Salary
55	6 263,914	9 418,573	2 125,700	0	1 44,564	0	0	0	0	18 852,751	Number Salary
60	5 222,488	0	0	0	0	0	0	0	0	5 222,488	Number Salary
63	1 40,000	1 70,787	0	0	0	0	0	0	0	2 110,787	Number Salary
66	0	0	0	0	0	0	0	0	0	0	Number Salary
67	0	0	0	0	0	0	0	0	0	0	Number Salary
68+	0	0	0	0	0	0	0	0	0	0	Number Salary
Total	355 10,805,330	240 9,400,810	7 296,242	1 62,370	1 44,564	0	0	0	0	604 20,609,316	Number Salary

Active Participants for The State of Montana as of July 1, 1991
All Participants

Age	1	5	10	15	Service				25	30	35	40+	Total	
20	22 256,326	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	22 256,326	Number Salary
25	625 9,893,250	166 3,123,031	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	791 13,016,281	Number Salary
30	590 9,797,789	745 15,244,870	228 5,531,387	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	1,563 30,574,046	Number Salary
35	722 11,733,382	727 15,836,901	766 19,325,050	218 6,406,946	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	2,433 53,302,279	Number Salary
40	854 13,819,981	838 19,976,501	664 17,983,869	914 28,042,948	355 11,834,869	3 122,700	0 0	0 0	0 0	0 0	0 0	0 0	3,628 91,780,868	Number Salary
45	1,017 15,207,061	624 15,804,512	480 13,868,463	585 18,789,052	939 32,550,197	304 11,159,825	0 0	0 0	0 0	0 0	0 0	0 0	3,949 107,379,110	Number Salary
50	275 4,123,894	312 7,290,607	274 7,796,229	310 9,952,895	434 15,236,709	603 22,300,133	151 5,580,139	1 34,554	0 0	0 0	0 0	0 0	2,360 72,315,160	Number Salary
55	138 2,156,989	116 2,655,673	111 3,066,020	166 4,908,379	204 7,156,407	253 9,362,106	255 9,813,798	51 2,036,666	1 39,859	0 0	0 0	0 0	1,295 41,195,997	Number Salary
60	63 971,615	42 978,367	53 1,633,151	66 1,911,066	112 3,732,096	109 3,980,859	101 3,948,561	93 3,682,245	18 730,864	0 0	0 0	0 0	657 21,568,924	Number Salary
63	13 221,852	13 372,659	8 234,147	11 330,812	18 485,349	17 634,978	15 523,495	9 371,483	6 253,851	0 0	0 0	0 0	110 3,428,626	Number Salary
66	0 0	3 95,809	0 0	3 84,214	2 62,613	4 159,984	1 37,785	1 28,431	3 115,960	0 0	0 0	0 0	17 584,796	Number Salary
67	3 11,833	1 28,019	1 41,731	2 36,765	2 71,366	0 0	1 28,580	2 66,868	0 0	0 0	0 0	0 0	12 285,162	Number Salary
68+	11 74,204	7 32,775	2 38,861	1 44,091	2 59,299	3 104,838	4 133,249	0 0	2 79,770	0 0	0 0	0 0	32 567,087	Number Salary
Total	4,333 68,268,176	3,594 81,439,724	2,587 69,518,908	2,276 70,507,168	2,068 71,166,905	1,296 47,825,423	528 20,065,607	157 6,220,247	30 1,220,304	0 0	0 0	0 0	16,869 436,254,462	Number Salary

Retired Participants for The State of Montana as of July 1, 1991
 TRS Non – Montana University System

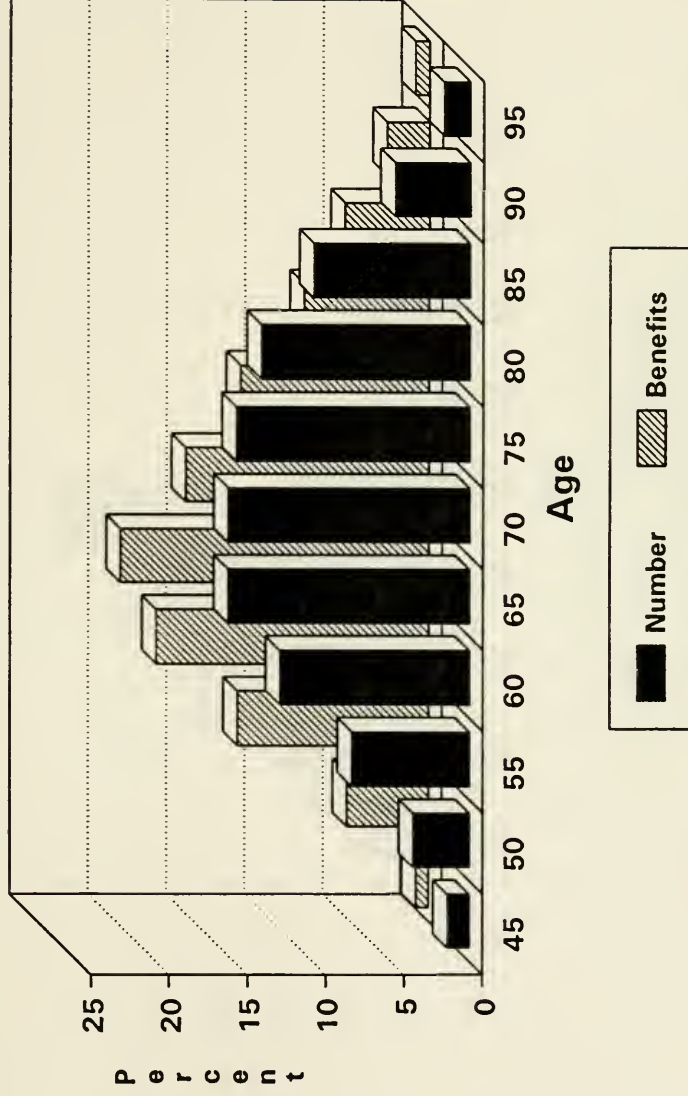
Age	Number	Monthly Benefit
45–	57	18,869
46	15	5,956
47	10	7,595
48	26	18,376
49	36	36,924
50	33	35,326
51	58	59,247
52	51	53,683
53	67	68,402
54	67	77,428
55	87	91,721
56	92	104,184
57	116	133,472
58	113	116,230
59	131	131,585
60	133	124,805
61	156	141,740
62	162	164,730
63	162	154,955
64	177	161,129
65	187	158,084
66	191	154,183
67	166	140,711
68	168	117,732
69	170	126,648
70	185	134,367
71	176	116,669
72	183	109,857
73	173	107,230
74	168	100,693
75	189	100,692
76	165	78,285
77	159	81,565
78	173	78,903
79	137	57,247
80	147	57,711
81	159	61,422
82	144	57,639
83	139	49,816
84	125	47,927
85	121	43,463
86	104	38,089
87	87	31,066
88	90	36,383
89	57	20,274
90	59	21,004
91	45	17,163
92	23	9,016
93	25	10,449
94	19	7,395
95+	51	18,639
Total	5,734	3,896,679

Retired Participants for The State of Montana as of July 1, 1991
 TRS Montana University System

Age	Number	Monthly Benefit
50 -	9	4,997
51	4	960
52	3	4,830
53	8	9,853
54	15	17,887
55	12	13,046
56	15	13,004
57	14	16,705
58	24	31,375
59	21	27,636
60	27	33,938
61	26	33,211
62	19	22,947
63	28	28,465
64	21	29,369
65	34	53,151
66	32	37,863
67	38	48,002
68	39	51,382
69	37	48,278
70	40	47,608
71	43	51,032
72	36	40,539
73	29	28,934
74	14	13,760
75	32	30,662
76	20	18,308
77	22	24,603
78	18	13,928
79	10	8,511
80	16	9,844
81	20	13,811
82	9	5,357
83	14	6,064
84	15	9,850
85	14	6,043
86	7	3,133
87	15	6,242
88	8	2,947
89	6	3,480
90	2	1,104
91	2	1,058
92	4	2,015
93	1	305
94	1	504
95+	7	2,369
Total	831	878,910

Retired Participants

TRS Non-MUS



Retired Participants TRS MUS

